

1 **CLAIMS:**

2 1. A semiconductor processing method of electrochemical-
3 mechanical removing at least some of a conductive material from over
4 an upper surface of a semiconductor substrate comprising displacing a
5 polishing operation location across the upper surface of the substrate
6 from a central region of the substrate toward a periphery of the
7 substrate and not displacing the polishing operation location from the
8 periphery to the central region.

9
10 2. The method of claim 1 wherein the polishing operation
11 location is defined by a location of a polishing pad relative to a surface
12 of the substrate, and further comprising rotating the polishing pad
13 separately from the displacement.

14
15 3. The method of claim 2 wherein an electrical circuit is
16 provided through at least a portion of the conductive material during the
17 removing, the circuit extending between the polishing pad and the
18 periphery.

19
20 4. The method of claim 2 wherein the displacing comprises
21 moving the substrate relative to the polishing pad.
22
23

1 5. The method of claim 2 wherein the displacing comprises
2 moving the polishing pad relative to the substrate.

3
4 6. The method of claim 2 wherein the displacing comprises
5 moving both the polishing pad and the substrate.

6
7 7. The method of claim 1 further comprising, after the
8 electrochemical-mechanical removing, chemical-mechanical polishing of the
9 substrate utilizing a process that is not electrochemical-mechanical
10 polishing.

11
12 8. A semiconductor processing method of electrochemical-
13 mechanical removing at least some of a conductive material from over
14 a surface of a circular semiconductive material wafer comprising radially
15 displacing a polishing pad across the surface of the wafer, the radial
16 displacing being only outwardly from a central region of the wafer and
17 not inwardly toward the central region.

18
19 9. The method of claim 8 wherein the polishing pad is
20 displaced circularly around the central region to define rings which
21 progress increasingly outward toward a periphery of the wafer.

1 10. The method of claim 9 further comprising rotating the
2 polishing pad separately from the displacement.

3
4 11. A semiconductor processing method of electrochemical-
5 mechanical removing of at least some of a conductive material from over
6 a surface of a semiconductor substrate comprising:

7 providing a substrate having a conductive material thereover;

8 providing a cathode at a first location of the substrate;

9 providing an anode at a second location of the substrate, the
10 anode being associated with a polishing pad polishing surface;

11 polishing the conductive material with the polishing pad polishing
12 surface, the polishing occurring at a region of the conductive material
13 and not at another region, the region where the polishing occurs being
14 defined as a polishing operation location; and

15 displacing the polishing operation location across the surface of the
16 substrate from said second location of the substrate toward said first
17 location of the substrate, and not displacing the polishing operation
18 location from said first location toward said second location when the
19 polishing operation location is between the first and second locations.

20
21 12. The method of claim 11 wherein the second location is more
22 centrally located on the substrate than the first location.

1 13. The method of claim 11 further comprising rotating at least
2 one of the polishing pad and the substrate separately from the
3 displacement.

4
5 14. The method of claim 11 wherein the polishing pad is pressed
6 between a structure and the substrate, and wherein the displacing the
7 polishing operation location comprises displacing the structure relative to
8 the polishing pad.

9
10 15. The method of claim 11 wherein the polishing pad only
11 covers a portion of the conductive material, and wherein the displacing
12 the polishing operation location comprises displacing the polishing pad
13 relative to the substrate.

14
15 16. The method of claim 15 wherein the displacing comprises
16 moving the substrate relative to the polishing pad.

17
18 17. The method of claim 15 wherein the displacing comprises
19 moving the polishing pad relative to the substrate.

20
21 18. The method of claim 15 wherein the displacing comprises
22 moving both the polishing pad and the substrate.

1 19. A semiconductor processing method of removing conductive
2 material, comprising:

3 providing a semiconductor wafer having a conductive material
4 thereover, the wafer comprising an upper surface and an outer periphery
5 around the upper surface, the conductive material extending across the
6 upper surface of the wafer and to about the periphery;

7 electrochemically removing at least some of the conductive material
8 with a polishing pad having a surface in abrasive contact with only a
9 portion of the conductive material; and

10 displacing the polishing pad across the upper surface of the wafer
11 during the removing, the displacing being only from a central region of
12 the wafer surface toward the periphery of the wafer.

13
14 20. The method of claim 19 wherein the polishing pad is
15 displaced circularly around the central region to define rings which
16 progress increasingly outward toward the periphery of the wafer.

17
18 21. The method of claim 19 further comprising rotating the
19 polishing pad separately from the displacement.

1 22. The method of claim 19 wherein an electrical circuit is
2 provided through at least a portion of the conductive material during the
3 removing, the circuit extending between the polishing pad and the
4 periphery.

5
6 23. A semiconductor processing method of removing conductive
7 material, comprising:

8 providing a semiconductor wafer having a conductive material
9 thereover, the wafer comprising an upper surface and an outer periphery
10 around the upper surface, the conductive material extending across the
11 upper surface of the wafer and to about the periphery;

12 electrochemically removing at least some of the conductive material
13 with a polishing pad having a surface in abrasive contact with only a
14 portion of the conductive material, the portion of the conductive material
15 in abrasive contact with the surface being defined as polishing operation
16 location, the polishing pad extending over the conductive material to
17 cover more of the conductive material than the polishing operation
18 location; and

19 displacing the polishing operation location across the upper surface
20 of the wafer during the removing, the displacing being only from a
21 central region of the wafer surface toward the periphery of the wafer.
22
23

1 24. The method of claim 23 wherein the polishing operation
2 location is displaced across the upper surface of the wafer without
3 displacing the polishing pad.

4
5 25. The method of claim 23 wherein the polishing operation
6 location is displaced circularly around the central region to define rings
7 which progress increasingly outward toward the periphery of the wafer.

8
9 26. The method of claim 23 further comprising rotating the wafer
10 separately from the displacement.

11
12 27. The method of claim 23 wherein an electrical circuit is
13 provided through at least a portion of the conductive material during the
14 removing, the circuit extending between the polishing pad and the
15 periphery.

1 28. A semiconductor processing method of removing conductive
2 material, comprising:

3 providing a semiconductor wafer having a conductive material
4 thereover, the conductive material defining a surface area, the surface
5 area having a first portion surrounded by a second portion;

6 providing a polishing pad surface in abrasive contact with the first
7 portion of the conductive material surface area and not in abrasive
8 contact with the second portion of the conductive material surface area;

9 providing a circuit that extends across at least some of the first
10 portion of the conductive material surface area;

11 electrochemically removing at least some of the conductive material
12 from the first portion of the surface area by polishing the first portion
13 with the polishing pad while flowing current through the circuit;

14 after electrochemically removing the at least some of the
15 conductive material from the first portion, displacing the polishing pad
16 relative to the wafer and electrochemically removing at least some of the
17 conductive material from the second portion; and

18 not electrochemically removing conductive material from the first
19 portion after electrochemically removing conductive material from the
20 second portion.
21
22
23

1 29. The method of claim 28 wherein the first portion of the
2 conductive material surface area is more centrally located on the wafer
3 surface than the second portion of the conductive material surface area.

4
5 30. The method of claim 28 further comprising rotating at least
6 one of the polishing pad and the wafer separately from the displacement.

7
8 31. The method of claim 28 wherein the displacing comprises
9 moving the wafer relative to the polishing pad.

10
11 32. The method of claim 28 wherein the displacing comprises
12 moving the polishing pad relative to the wafer.

13
14 33. The method of claim 28 wherein the displacing comprises
15 moving both the polishing pad and the wafer.

1 34. A semiconductor processing method of electrochemically
2 removing conductive material, comprising:

3 providing a semiconductor wafer having a conductive material
4 thereover, the conductive material defining a first surface area, the first
5 surface area having a central portion and an outer peripheral portion
6 surrounding the central portion, the outer peripheral portion having an
7 outermost edge;

8 providing at least one first electrical contact in electrical connection
9 with the outermost edge of the outer peripheral portion of the
10 conductive material;

11 providing a polishing pad proximate the central portion of the
12 conductive material, the polishing pad having a polishing surface, the
13 polishing surface defining a second surface area, the second surface area
14 being less than the first surface area;

15 providing at least one second electrical contact in electrical
16 connection with the polishing surface of the polishing pad, the first and
17 second electrical contacts being in electrical connection through a power
18 source and defining a circuit that extends through the conductive
19 material;

20 electrochemically removing at least some of the conductive material
21 from the central portion by polishing the wafer with the polishing pad
22 while flowing current through the circuit; and

23 only after electrochemically removing at least some of the

1 conductive material from the central portion, displacing the polishing pad
2 relative to the wafer to provide the pad proximate the outer peripheral
3 portion of the conductive material and utilizing the polishing pad to
4 electrochemically remove at least some of the conductive material from
5 the peripheral portion.
6

7 35. The method of claim 34 wherein the displacing comprises
8 moving the polishing pad circularly around the central region to define
9 rings which progress increasingly outward toward the peripheral portion
10 of the wafer.
11

12 36. The method of claim 34 wherein the displacing comprises
13 moving the wafer relative to the polishing pad.
14

15 37. The method of claim 34 wherein the displacing comprises
16 moving the polishing pad relative to the wafer.
17

18 38. The method of claim 34 wherein the displacing comprises
19 moving both the polishing pad and the wafer.
20
21
22
23